

## Response to Comments June 16, 2004

### Draft Remedial Investigation Report for Operable Unit 5, Sites 1 and 2, MCAS Cherry Point, North Carolina

#### Comments Received from George Lane, North Carolina Department of Environment and Natural Resources (NCDENR)—March 1, 2004

##### Section 2—Background

1. Why is there a 1GW04B and no 1GW04A? Is this explained anywhere in this document? Also, Figures 2-10 and 2-11 have this well labeled 1GW04 without the "B". Please label this well 1GW04B to avoid confusion. Also, please put 1GW04B on Figure 2-3 as it is labeled a Site 1 well.

##### Response:

*Agree.* The "B" is a designation that was used at the time to indicate that this well is screened in the *lower* surficial aquifer. A footnote will be added to Table 2-2, which provides construction specifics for existing monitoring wells. The "B" will be added to the well IDs on Figures 2-10 and 2-11, and the well location will be added to Figure 2-3.

2. Subsection 2.2.1, first paragraph, last sentence---There are no well locations shown on Figure 2-2. Add the well locations to Figure 2-2.

##### Response:

*Agree with qualification.* The last sentence of the first paragraph in Subsection 2.2.1 will be changed to read "The well locations are shown on Figures 2-3 and 2-9."

3. In Figures 2-3 & 2-9 the well locations are labeled with the "MW" designation instead of "GW". This could be confusing to the public. While table 2-2 does indicate the change of well designations in 2002, please label all well locations "GW" (i.e., 1GW01) in this section or put a note on the figures explaining that the MW and GW well locations are the same well and the designations were change in the 2002 RI.

##### Response:

*Agree.* Figures 2-3 and 2-9 will be changed so monitoring well IDs are consistent. The "GW" designation will be used on the figures.

## Comments Received from Dave Lilley, North Carolina Department of Environment and Natural Resources (NCDENR)—March 1, 2004

### Human Health Risk Assessment—Site 1

1. Appendix I, Tables 2.x: The concentration of silver is listed as ND in the surface soil tables, but the concentration range in Table C-1 is 0.11 to 0.16 mg/kg. Please correct this inconsistency.

#### Response:

*Agree.* The appropriate changes will be made to Table C-1 to make it consistent with Appendix I, Tables 2.x, which are correct.

2. Appendix I, Tables 2.x, surface water: Based on a spot check, it appears as though the Screening Toxicity Values based on the Region 9 PRGs were taken from an old table. According to the October 2002 version of the PRG table, the Screening Toxicity Value for 1,1,1-trichloroethane should be 320 µg/L, not 54 µg/L as listed in Table 2.3. The value for xylene should be 21 µg/L, not 140 µg/L as listed in Table 2.3. Please update this table and check other tables in this risk assessment where a pre-October, 2002 PRG table may have been used.

#### Response:

*Agree.* The screening values for surface water will be updated using the October 2002 Region 9 PRG tables, National Recommended Water Quality Criteria (2002) and the most recent version (April 2003) of the North Carolina Water Quality Standards.

3. Appendix I, Tables 3.x: The difference in these tables is not always clear. For example, the Scenario Timeframe, Medium, Exposure Medium, and Exposure Point are identical for Tables 3.9 and 3.10. Please review all tables 3.x and make sure the differences are clear.

#### Response:

*Agree.* The appropriate receptors were not specified in Tables 3.9 and 3.10. Table 3.9 presents medium-specific exposure point concentrations (EPC) for a resident while Table 3.10 presents EPC's for a construction worker. The suggested changes will be incorporated into the Tables 3.4, 3.5, 3.6, 3.7, 3.9 and 3.10 as a footnote.

4. Appendix I, Table 4-13: Where is Table 5.12? Is this a typo?

#### Response:

*Agree.* The RME value(s) referenced in Table 4.13 were contaminant concentrations in air in a shower scenario that were calculated from groundwater concentrations. Table 5.12 does not exist and a reference to it in Table 4.13 has been removed and replaced with the word "modeled". A closer look at other Table 4's revealed that they should be revised to reference the appropriate Table 3's for the reasonable maximum exposure (RME) and central tendency (CT) values. These changes will be incorporated as well.



5. Appendix I, Table 4-28, footnote 1: Please replace "Appendix ?" with a reference to the portion of the RI that explains how the PEF was calculated.

**Response:**

*Agree.* No COPCs were selected in the subsurface soil to air emission scenario (Table 2.14). Therefore cancer and noncancer risks were not calculated for the inhalation route for a construction worker exposed to contaminants emanating from subsurface soil to air. Table 4.28 will be eliminated from the Appendix I and all subsequent tables will be renumbered.

6. Appendix I, Table 7.8A RME Supplement: The last equation on this table does not match the equation at the bottom of page 7-14. Please resolve this inconsistency.

**Response:**

*Agree.* The equation for the dermally absorbed dose for a showering event (DAevent) is incomplete as expressed at the bottom of p. 7-14. The appropriate corrections will be incorporated into the HHRA text and Tables 4-5, 4-6, 4-10, 4-12, 4-29, 4-30 and 4-31.

7. Figure 5-3: The highest concentration of 1,1-dichloroethene at Site 1 did not exceed any of the screening criteria. Why does it appear in this figure?

**Response:**

*Agree.* Figure 5-3 will be corrected by removing 1,1-dichloroethene.

8. Appendix I, Tables 3.x, groundwater: Footnote 1 states that, following EPA Region 4 guidance, the arithmetic average was used as the RME and CT concentration. Region 4 guidance (which can be found on the Internet at <http://www.epa.gov/region4/waste/ots/healthbul.htm>) actually states that "Groundwater exposure point concentrations should be the arithmetic average of the wells in the highly concentrated area of the plume". Region 4 also issued an update to this guidance on August 29, 2002. Basically, this guidance states that the risk posed from each well should be calculated, the well with the highest risk is the center of the plume. One or two wells in close proximity to that well can be used to calculate an average concentration, if the risk from these wells is within an order of magnitude of the highest risk. Please use these procedures to calculate the EPC for groundwater.

**Response:**

*Agree.* RME Risks to receptors from exposure to COPC's in groundwater will be re-evaluated using the maximum contaminant concentration found on the site and remedial goal options (RGO's) will be calculated according to EPA Region 4 guidance.

**Human Health Risk Assessment—Site 2**

1. Appendix I, Tables 2.x, surface soil: According to Table C-7, the maximum detected value of selenium is 0.49 mg/kg, not 0.44 mg/kg as shown on these tables. Also, the maximum detected concentration of silver is 0.15 mg/kg, not ND. Please correct.

**Response:**

*Agree.* The appropriate changes will be made to Table C-7 to make it consistent with Appendix I, Tables 2.x, which are correct.

2. Appendix I, Tables 2.x, subsurface soil: According to Table C-8, the maximum detected value of selenium is 0.42 mg/kg, not ND as shown on these tables. Also, the maximum detected concentration of silver is 0.12 mg/kg, not ND. Please correct.

**Response:**

*Agree.* The appropriate changes will be made to Table C-8 to make it consistent with Appendix I, Tables 2.x, which are correct.

3. Appendix I, Tables 2.x, surface water: Based on a spot check, it appears as though the Screening Toxicity Values based on the Region 9 PRGs were taken from an old table. According to the October 2002 version of the PRG table, the Screening Toxicity Value for 1,1,1-trichloroethane should be 320 µg/L, not 54 µg/L as listed in Table 2.3. The value for xylene should be 21 µg/L, not 140 µg/L as listed in Table 2.3. Please update this table and check other tables in this risk assessment where a pre-October, 2002 PRG table may have been used.

**Response:**

*Agree.* See response to comment #2, Site 1.

4. Appendix I, Tables 3.x: The difference in these tables is not always clear. For example, the Scenario Timeframe, Medium, Exposure Medium, and Exposure Point are identical for Tables 3.9 and 3.10. Please review all tables 3.x and make sure the differences are clear.

**Response:**

*Agree.* See response to comment #3, Site 1.

5. Appendix I, Table 4-13: Where is Table 5.12? Is this a typo?

**Response:**

*Agree.* See response to comment #4, Site 1.

6. Appendix I, Table 4-28, footnote 1: Please replace "Appendix ?" with a reference to the portion of the RI that explains how the PEF was calculated.

**Response:**

*Agree.* See response to comment #5, Site 1.

7. Appendix I, Table 7.8A RME Supplement: The last equation on this table does not match the equation at the bottom of page 7-14. Please resolve this inconsistency.

**Response:**

*Agree.* See response to comment #6, Site 1.



8. Appendix I: Tables 2.7 and 2.8 are the same. Should the Exposure Point for Table 2.7 have read "Showerhead"?

**Response:**

*Agree.* The exposure point for Site 2 Table 2.7 will be revised to read "Shower".

9. Appendix I, Table 2.11: For benzo(a)anthracene, the maximum concentration of 1.3 mg/kg exceeds the screening value of 0.62 mg/kg, it is selected as a COPC, but in the "Rationale for Contaminant Deletion or Selection" column, it is stated that the detection limit is below the screening value. Please correct this inconsistency and check all tables in Appendix I.

**Response:**

*Agree.* The rationale for selection of benzo(a)anthracene as a COPC should have been because the maximum concentration was above the screening level (ASL) and not that the detection limit was below the screening level (DLBSL). This error will be corrected.

10. Appendix I, Table 2.11: For indeno(1,2,3-cd)pyrene, the maximum concentration of 0.72 mg/kg exceeds the screening value of 0.62 mg/kg, it is selected as a COPC, but it does not appear in Table 3.9. Please correct.

**Response:**

*Agree.* Indeno(1,2,3-cd)pyrene will be included as a COPC in Table 3.9.

11. Appendix I, Table 2.11: According to the Data Collection and Evaluation section of EPA Region IV's *Supplemental Guidance to RAGS: Region IV Bulletins, Human Health Risk Assessment*, "Any member of a chemical class that has other members selected as COPCs should be retained (e.g., detected carcinogenic polynuclear aromatic hydrocarbons)". This means that if one carcinogenic PAH is selected as a COPC, all other carcinogenic PAHs detected in that medium should be retained. For this reason, benzo(k)fluoranthene and chrysene should be added to Table 3.9.

**Response:**

*Agree.* The suggested changes will be incorporated in Table 3.9.

12. Appendix I, Table 2.12: For the same reason as presented in comment 11, the following carcinogenic PAHs should appear in Table 3.10: benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, and indeno(1,2,3-cd)pyrene. Please correct.

**Response:**

*Agree.* The suggested changes will be incorporated in Table 3.10.

13. Appendix I, Tables 2.x, groundwater tables: What does "W" in the Screening Toxicity Value column represent?

**Response:**

*Agree.* The designation "W" in Tables 2.3, 2.5, 2.6, 2.7 and 2.8 stands for North Carolina Water Quality Standards. This information will be added as a footnote to the appropriate tables.

14. Appendix I, Tables 3.x, groundwater: Footnote 1 states that, following EPA Region 4 guidance, the arithmetic average was used as the RME and CT concentration. Region 4 guidance (which can be found on the Internet at <http://www.epa.gov/region4/waste/ots/healthbul.htm>) actually states that "Groundwater exposure point concentrations should be the arithmetic average of the wells in the highly concentrated area of the plume". Region 4 also issued an update to this guidance on August 29, 2002. Basically, this guidance states that the risk posed from each well should be calculated, the well with the highest risk is the center of the plume. One or two wells in close proximity to that well can be used to calculate an average concentration, if the risk from these wells is within an order of magnitude of the highest risk. Please use these procedures to calculate the EPC for groundwater.

**Response:**

*Agree.* See response to comment #8 Site 1.

15. Figure 5-8: The highest concentration of 1,1-dichloroethene did not exceed any of the screening criteria. Why does it appear in this figure?

**Response:**

*Agree.* Figure 5-8 will be corrected by removing 1,1-dichloroethene.

**Ecological Risk Assessment—Sites 1 and 2**

1. Page 8-1: The NC Division of Waste Management now has guidance on conducting Screening Level Ecological Risk Assessments (SLERA). The guidance can be found at <http://www.wastenotnc.org/techedguide.htm>. This guidance should be used to conduct future SLERAs.

**Response:**

*Agree.* The guidance will be used to conduct future SLERAs.

2. Figures 5-1 and 5-6: It is unclear why a differentiation is made between a "BTAG-Soil Fauna" and a "BTAG-Soil Flora" at this point in the process. Please explain.

**Response:**

The nature and extent of contamination discussion precedes the Fate and Transport and Human Health and Ecological risk assessment data evaluation, and is a preliminary screening of the data to evaluate possible site contaminants. To effectively discuss possible contaminants at the site, all potential screening criteria are used and exceedances are discussed to gain a broad perspective of potential site contaminants. Therefore, the soil flora and fauna screening criteria, which have different values for respective compounds, are used and exceedances are shown on Figures 5-1 and 5-6 to give a spatial representation of the potential contaminants.



3. According to Table 8-4, the maximum concentration of mercury is 0.16 mg/kg at sampling location OU5 S2-SS05-01. This concentration appears as 0.6 mg/kg at sampling location OU5 S2-SS05-01 on Figure 5-6. Please correct this inconsistency.

**Response:**

*Agree.* The figure will be amended. In addition, the results for silver in Figure 5-6 (SS01 and SS06) are incorrectly marked as exceeding two times the average background concentration when they do not. These errors will also be corrected.

4. Please include a regional ecological summary for this site.

**Response:**

*Agree.* A regional ecological summary will be included.

5. Please include a list of Craven County Endangered Species, Threatened Species, and Federal Species of Concern (<http://nc-es.fws.gov/es/cntylist/craven.html>).

**Response:**

*Agree.* The requested list of rare species will be included.

6. It is recommended that the environmental checklist presented in *Representative Sampling Guidance Document, Volume 3, Ecological* be completed in order to aid site characterization. A slightly modified version of this checklist can also be found in the guidance mentioned in comment 1. At a minimum, all the information requested in this checklist should appear in the SLREA. If any information is not available for the SLERA, it could be addressed as a data gap.

**Response:**

*Agree.* The checklist included in the NC guidance will be used and included in future SLERAs. The majority of the information requested in the checklist is already in the ecological risk assessment.

7. A Scientific/Management Decision Point (SMDP) section must be included regarding the outcome of the SLERA.

**Response:**

*Agree.* A formal SMDP section will be included in the final document.

8. Tables 8-3 and 8-6: The surface water concentrations listed in this table for inorganics are for the dissolved fraction. The Region 4 screening values are for totals. Therefore, totals must be used in the abiotic screen. Please correct.

**Response:**

*Agree with Qualification.* Promulgated Federal Ambient Water Quality Criteria for most inorganic analytes are expressed as dissolved concentrations. This is why the dissolved fraction was used in the screen. The dissolved fraction is the biologically important fraction for most aquatic receptors. Use of total may overestimate risk and likely be very erroneous for some samples where the water was very shallow

during sampling. It is likely that some of the total data include particulate matter (sediment) stirred up during the process of sampling. The actual total values for AWQC are simply artifacts of how much of the metal was not in the dissolved form when the toxicity tests the criteria are based on were conducted. In most of these tests, the intention was for most of the metal to be in the dissolved form (i.e., a salt was used). This is why paired total and dissolved AWQC are similar. In nature, dissolved and total measurements may be very dissimilar, and subject to influence by sampling technique. The dissolved to dissolved comparison is the most relevant ecological comparison. Most of the total AWQC provide no compelling information regarding the potential for risk in a turbid total field sample.

The screen will be redone using totals. A comparison using dissolved concentrations will be presented in Step 3. The end result of the assessment will be the same.

9. Page 8-3: It is claimed that TOC, pH, and grain size analysis was conducted on surface soil and sediment samples, and surface water samples were analyzed for total hardness. Please present this data in this report.

**Response:**

*Disagree.* All of this information is presented within Appendix C. Portions of this set of information are referenced in various parts of the report, including the ERA.

10. Table 8-4: The following EPA Region 4 ESVs should replace the values given in this table:

1,1-Biphenyl	60,000 µg/kg
2,2'-Oxybis(1-chloropropane)	100 µg/kg
2,4-Dichlorophenol	3 µg/kg
2,4-Dimethylphenol	500 µg/kg
2-Methylphenol	500 µg/kg
2-Nitrophenol	7,000 µg/kg
3,3'-Dichlorobenzidine	100 µg/kg
4-Chlorophenyl-phenyl ether	10 µg/kg
4-Methylphenol	500 µg/kg
phthalates without ESV	100,000 µg/kg total
PAHs without ESV	1,000 µg/kg total
Atrazine	0.05 µg/kg
Benzaldehyde	100 µg/kg
Hexachlorobutadiene	100 µg/kg
Hexachloroethane	100 µg/kg
Bis(2-Chloroethoxy)methane	100 µg/kg
Bis(2-Chloroethyl)ether	100 µg/kg

Only the SVOCs were reviewed. Some of the values were taken directly from the US EPA Region 4 guidance, others are surrogate values agreed upon by NC DWM and EPA Region 4 personnel. The values are presented in the NC DWM guidance mentioned in comment 1. It is recommended this guidance be obtained and the screening values in this document used in this risk assessment.



**Response:**

*Agree.* The screen will be amended as requested.

11. Table 8-6: In addition to the Region 4 screening values, sampling results must be compared to the NC Surface Water Standards. Contaminants that exceed the NC Surface Water Standards should not be carried to Step 3 unless they also exceed the Region 4 screening value. Exceedances of the NC Surface Water Standards should be compiled in a separate table.

**Response:**

*Agree.* The NC Surface Water Standards will be added.

12. Table 8-6: Since no Region 4 screening value exists for most PAHs, the screening value for acenaphthene (17 µg/l) can be used for total PAHs.

**Response:**

*Agree.* The change will be made as requested.

13. Table 8-6: Since no Region 4 screening value exists for di-n-octylphthalate, the screening value for bis(2-ethylhexyl)phthalate (0.3 µg/l) can be used.

**Response:**

*Agree.* The change will be made as requested.

14. Table 8-6: Were pH readings taken for the surface water? If so, please include the pH data so the screening value for pentachlorophenol can be calculated.

**Response:**

*Agree.* Measurements of pH were made. The pH data will be included and the pentachlorophenol screening value will be calculated as requested. The pH data is provided in Appendix G.

## Comments Received from Gena Townsend, United States Environmental Protection Agency (EPA)—March 4, 2004

### General Comments

1. One of the major problems that exist with this document is the apparent failure to visualize the site and review the data from a more holistic perspective. During data review, important questions were not answered. Questions such as:
  - a) Why are the highest concentration of constituents detected in sediment located upgradient of Site 1 in Reeds Gut and at the most downgradient location for Site 2?
  - b) Should the samples have been analyzed for other constituents besides inorganics and volatiles?
  - c) Are 8 soil samples sufficient to determine the constituents potentially present in landfill waste especially since this waste is often heterogeneous in nature?
  - d) Does the location of soil samples, while somewhat biased, take into account surficial runoff from the sites toward the adjacent water bodies? Apparently, no sampling was done to try to determine surficial runoff of contaminants.
  - e) Has the data that has been collected been sufficient to answer risk questions and resolve any major uncertainties?

The answer to these questions would provide a more comprehensive and holistic understanding of the two sites and the risks posed by the contaminants present.

### Response:

*Disagree.* The RI was conducted in accordance with the NCDENR-approved and EPA-approved Work Plan, which specified the number of samples to be collected, their locations, and the constituents that would be included in the analyses. The Work Plan approach was based on the premise that previous investigations had revealed little, if any contamination at OU5. Consequently, a prime objective of the field investigation described in the RI report was to determine whether significant contamination even existed at OU5, and if so, to further delineate that contamination and determine likely source areas during subsequent field efforts. In contrast, this comment appears to be based on the premise that OU5 does contain significant contamination (which is not supported by the results of previous investigations or this RI). As such, the comment seems to imply that, in the absence of significant evidence of contamination, it is necessary for the RI to prove the negative conclusion with regard to contamination (i.e., that OU5 is not contaminated), a nearly impossible task since only a relatively small portion of any site can ever be physically sampled.

As described in the Work Plan, what was intended to be a first phase of field activities was designed to thoroughly and broadly screen the site for evidence of contamination. Because OU5 covers a large area and previous investigations had not revealed any known areas of contamination, it was determined that collecting numerous soil samples was an inefficient and improper way to adequately perform a



broad screening of OU5. This is because soil contamination at disposal sites such as OU5 is usually very limited in horizontal and vertical extent, which increases the odds of missing potentially significant contamination during an investigation, even with a large number of soil samples. Since the depth to groundwater at OU5 is relatively small, the nature of the disposal was reportedly in borrow pits (further reducing the depth to groundwater), and the predominantly sandy site soils have relatively high permeability, it was determined that any significant soil contamination would likely be manifested in shallow groundwater contamination, which typically has a greater spatial extent than source area soil contamination. Consequently, the RI approach for the initial phase of field investigation was to collect a large number of groundwater samples to provide broad coverage of groundwater immediately downgradient of disposal areas. A smaller number of soil samples targeted to identify disposal areas was also included in the approved sampling plan to determine if the disposal areas contained widespread soil contamination. Based on the approach described in the Work Plan, the intention was to conduct further field investigation activities if the broad-based groundwater sampling or targeted soil sampling revealed any indication of significant contamination at OU5. The objectives of these subsequent field activities would be to further delineate the extent of any contamination and to target soil sampling to determine the sources of any detected hot spots in groundwater.

As it turned out, the initial phase of RI field activities revealed very little site-related contamination. Human health and ecological risk assessments performed on the data concluded that there were no significant risks to human health or the environment. In our judgment, these results do not warrant any further investigation activities to be able to reach a conclusion as to whether OU5 poses unacceptable human health or environmental risks.

Responses to specific elements of this comment are addressed below:

- a) This comment concerns concentrations of inorganic constituents detected in Reeds Gut sediments. The RI concluded that the detected concentrations of these constituents were indicative of natural, background conditions. Therefore, the spatial distribution of these constituents is not related to site activities. The comment appears to be based on the premise, which we believe is incorrect, that the concentrations and distribution of inorganic constituents in Reeds Gut sediments are the result of OU5 site activities.
- b) The approved Work Plan addressed the constituents for analysis in the RI. The suite of analytes called for in the Work Plan was based on historical knowledge of disposal practices at MCAS Cherry Point, visual observation of the waste material, and the chemical analytical results of previous investigations (e.g., for pesticides).
- c) See the general response above concerning the sampling approach used for the RI. In our judgment, the lack of significant groundwater contamination found in the extensive groundwater sampling is evidence that it is unlikely that a significant area of soil contamination exists at OU5. The groundwater results do not point toward any preferential locations for additional soil sampling.

- d) As stated above, the soil samples were targeted to known areas of waste disposal. Had any significant surficial soil contamination been found in the disposal areas, or had there been any significant contamination found in surface water or sediment, which are the receptor media for surficial runoff of soil contamination, then additional investigation of this potential pathway for contaminant migration would have been warranted.
- e) The RI concluded that there were no human health or ecological risk issues at OU5 that were related to site contaminants. The only risk issue identified in the human health risk assessment was the cumulative hazard across all media for the resident child due to arsenic, which was found at OU5 at concentrations consistent with natural background conditions. Therefore, we conclude that the RI data are sufficient to answer any risk questions that have arisen from that data. There will always be uncertainty as to whether the investigation activities failed to locate a significant area of contamination at the site. In our judgment, the broad-based coverage of the site built into the investigation approach from the approved Work Plan minimizes the level of such uncertainty to the degree that additional investigation activities are not warranted.

**Proposed action:** Based on partnering team discussions of this comment and the preliminary response, clarifying information will be added to the text of the RI report in order to address the points made above in response to this comment. Specifically:

1. The discussion of the phased approach to the field investigation for this RI will be improved and expanded. The rationale for not conducting a second phase of investigation activities will be better explained.
2. The discussion of sample locations and the rationale for their selection will be expanded to include specific discussion of individual sample locations.
3. The discussion of the waste disposal areas will be revised to more accurately describe the physical appearance of most of the waste disposal areas. The current text gives the impression that wastes were mostly disposed of in "pits", whereas they actually appear to be mostly above-grade bermed areas.
4. The site-specific lithology based on the soil boring logs from the numerous direct-push temporary monitoring well locations will be more completely described.
5. The rationale for not including pesticides in the RI analyte list will be better described to indicate the lack of pesticides found during previous investigations. In addition, the other disposal areas at the Air Station which are known locations of pesticide or PCB waste disposal will be discussed in conjunction with the discussion of waste types that may have been disposed of at OU5.
6. The analytical results for silver in surface water and sediment samples will be re-examined to determine whether revisions to the text are necessary to better explain the interpretation of results.



2. The conclusion of no further action is based on the determination that the analytical values were "slightly" over twice average background (2xAB) concentrations and therefore acceptable. The term 'slightly' is imprecise and thus misleading. For example, three lead concentrations in surface soil at Site 1 were 11.4, 11.6, and 34.6 mg/kg, all in excess of the 2xAB of 10.52 mg/kg. Similarly arsenic in surface soil at 4.9 mg/kg vs. 3.9 mg/kg (2xAB) is an exceedance. Subsurface soil and groundwater showed the same type of arsenic exceedances. Exceedances of the 2xAB are still exceedances. There is no clear delineation of any contaminant of potential concern in the entire document (one of the main goals in a remedial investigation). Please provide a figure of each exceeding contaminant or group of contaminants in a figure form that includes horizontal and vertical boundaries. If delineation is not demonstrated in the figures, then the investigation should move on to the next step of complete delineation of all media with exceedances. The "No Further Action" recommendation proposed is not supported.

**Response:**

*Disagree.* The 2xAB screening criteria are not regulatory standards and an exceedance of 2xAB by a particular constituent does not automatically make the constituent a contaminant of potential concern (COPC). In order to simplify the process of evaluating whether site inorganic constituent concentrations are indicative of background conditions or site-related contamination, 2xAB concentrations were used as convenient, quantitative criteria for comparison to site data. However, further analysis is required to determine whether or not exceedances of 2xAB represent site contamination or naturally occurring concentrations. In a normally distributed sample population, it would be *expected* that a small percentage of the results would exceed 2xAB and still be representative of background concentrations.

In order to put the OU5 RI soil and groundwater data in perspective with regard to background comparisons, a series of tables have been put together for the purpose of evaluating exceedances of 2xAB concentrations (see Attachment A). Attachment A contains a series of tables for each of the following media: Surface soil, subsurface soil, and groundwater. For each of these media, there are tables that identify the number of exceedances of 2xAB for each detected inorganic constituent for both Sites 1 and 2. As stated earlier, it is expected that a small percentage of results would exceed 2xAB in a normally distributed sample population. Attachment A indicates that in only a few cases did more than a small percentage of the results exceed 2xAB: Lead in surface soil and groundwater and barium and chromium in subsurface soil.

In order to further evaluate these results exceeding 2xAB, the last column of these tables lists the number of results for each constituent that exceed the maximum concentration in the background data set (i.e., results that are higher than the range of background concentrations at MCAS Cherry Point). Keep in mind that the background data sets for MCAS Cherry Point are relatively small (21 soil samples, 14 groundwater samples), so even an exceedance of the maximum background concentration for a particular constituent would not necessarily indicate a COPC. Nevertheless, for the purposes of this exercise, if it is assumed that all exceedances of the maximum background concentration represent potential site contaminants, these data can be further evaluated to determine if they pose potential human health risks

or regulatory issues. All results that exceeded the maximum background concentration are highlighted in yellow in the third column of the tables in Attachment A. With the exception of lead in surface soil at Site 2, only 1 or 2 samples for each media in the entire RI data set exceeded the maximum background concentration of a particular constituent.

The third and last table for each of the three media in Attachment A further evaluates the yellow-highlighted results for each constituent that exceeded the maximum background concentration. For each constituent with at least one exceedance of the maximum background concentration, the maximum concentration (i.e., worst case result) is compared to relevant risk-based screening criteria or regulatory standards. In every case, the results for all media were well below any screening criterion or regulatory standard. It is concluded from this analysis that even though a small percentage of inorganic constituent results in soil and groundwater at OU5 exceed naturally occurring background concentrations, none of these results exceeding background are indicative of threats to human health or the environment. We believe that the inorganic constituent data from the RI are supportive of the no further action recommendation for OU5.

Proposed action: No figures showing delineation of 2xAB exceedances will be prepared since none of these results represent COPCs. However, the evaluation presented in Attachment A will be added to the RI text in Section 5, and the conclusions discussed in Section 9 and other sections with respect to inorganic constituents will be revised to more clearly indicate that the results for all detected inorganic constituents in soil and groundwater fell into one of two categories: (1) results were representative of naturally occurring background concentrations, or (2) results exceeding background concentrations were well below relevant risk-based screening criteria or regulatory standards.

3. There appears to be a major discrepancy between the original outline of the site and the location of waste piles. The aerial extent of Sites 1 and 2 are not clearly presented with respect to the waste piles. Based on rough estimate of the size of Site 1, using an outline of the identified waste/fill areas, it appears that the site is about 10 acres. For Site 2, the total disturbed area of Site 2 was previously estimated to be approximately 4 acres. Based on rough estimate of Site 2 size using an outline of the identified waste/fill areas, it appears that the site is roughly 8.0 acres. Due to the unique nature of landfill waste, it is questionable if 8 soil sample locations at each Site are sufficient to demonstrate whether or not there are chemicals present at the two Sites that contribute to human health and/or ecological risk.

**Response:**

*Disagree.* As the comment indicates, there is indeed a major discrepancy between the original outline of the site and the actual location of the waste piles. This fact is pointed out in Section 2.1.2. The actual areal extent of the waste piles at both Sites 1 and 2 are clearly shown in a number of figures throughout the RI report. Although we did not create new site boundary lines in the report figures, the extent of the Site 1 and 2 study areas is readily apparent in Figures 3-1 and 3-2 of the RI report.



The acreage estimates of Sites 1 and 2 in the comment appear to represent more than just the disposal (i.e., "disturbed") areas. Based upon a re-evaluation of the areal extent of the disposal areas identified in the RI figures, neither Sites 1 and 2 have actual disposal areas that exceed 4 acres.

See the response to EPA general comment 1 above with regard to the issue of whether the number of collected samples was adequate.

**Proposed action:** None.

4. It is unclear if earlier data associated with OU5 media has been collected but was not discussed in this document. Based on a review of Section 2.0, the only historical data that exist was limited to groundwater sampling. If this data does exist, it is recommended that a summary of historical data be added to this document.

**Response:**

*Disagree.* Section 2.2 of the RI report presents the results of all known previous investigations at OU5. As the text indicates, the data from these investigations was limited to groundwater samples.

**Proposed action:** None.

5. There is no discussion or consideration of fill material depth at the site or comparison to soil sampling depths. Surface sampling from 0-1 ft bls and subsurface sampling from 3-4 ft bls leaves a 2 foot data gap in soil, but more significant is the gap from 4ft to 7ft bls, the top of the water table estimated for OU5. Historically, fill material often reaches to the top of the water table in these borrow pit type of landfills. Please discuss how this may have influenced sampling location selections. Also, it does not appear that the soil and groundwater samples were collected from the same location. Although there may not be an identifiable plume, the lack of soil data at the groundwater interface does not verify that the soil levels are protective of groundwater.

**Response:**

*Disagree.* The investigation approach for the RI is described briefly in the response to EPA general comment 1 and in detail in the approved Work Plan. It is agreed that it is possible that in a borrow pit type of disposal area, it is possible for waste material to be placed near the water table when the depth is only approximately 7 feet. However, given the highly permeable nature of the sandy soils beneath OU5, it is likely that any significant contamination in soil just above the water table would manifest itself in groundwater contamination. Areas immediately downgradient of disposal areas were sampled for groundwater contamination and the sampling approach included broad coverage of the operable unit as a whole with respect to groundwater sampling. Had any significant groundwater contamination been found at any location, more intensive depth-discrete soil sampling would have been conducted in later phases of investigation. Since no groundwater contamination was found beyond trace levels of several compounds at a few locations, no potential soil contamination source areas were identified.

**Proposed action:** None.

6. There is a concern about the site and proximity to nearby waterways and the Atlantic Ocean. There should be a discussion of tidal influence on groundwater elevation, which includes consideration of back flow of groundwater toward the west and south. It is understood that diurnal tides may have minimal affect in the Neuse River but a seiche (wind blown) tide across the considerable fetch of Pamlico Sound could back the water up a foot or two in Reeds Gut. As such, this may not be a huge influence within a particular sampling period, but it may, over time, show some contaminant migration in areas west or south of a source. For instance, contaminant in sediment further upstream in Reed's Gut might be caused by this affect. For this reason, please include a discussion of tidal affects on contaminant and groundwater movement.

**Response:**

*Disagree.* The analysis and discussion described in the comment may be relevant and appropriate had any significant site-related contamination that posed an unacceptable risk to human health and the environment been found in any media at OU5. Since a discussion of tidal effects on contaminant migration at OU5 cannot be tied to site-related contaminant migration, a hypothetical discussion of these issues would unnecessarily confuse the reader.

**Proposed action:** None.

7. Several sections within the Risk Characterization subheading state that arsenic in the sediment and groundwater is the main contributor to risk for the residential child. In addition, the text states that the maximum concentration of arsenic in the groundwater was only slightly above two times the average background concentration, and the arsenic concentration used in the quantitative risk evaluation for groundwater was the maximum detected level at the site. Arsenic is also stated to be a compound that is ubiquitous in the environment. Therefore, the discussion concludes that the risk associated with arsenic may not be related to site activities, but may be associated with background conditions. This line of reasoning is not appropriate for eliminating arsenic from further consideration. Arsenic does exceed two times the average background concentration and has been proven to contribute to risk. Therefore, arsenic risks should not be discounted. Additional geochemical evaluation may be warranted or the uncertainties regarding arsenic risks should be presented in the uncertainty section.

**Response:**

*Disagree.* As shown in the evaluation of soil and groundwater RI data with respect to background concentrations in Attachment A, only 1 out of 29 groundwater samples at OU5 contained arsenic that exceeded the 2xAB concentration. Moreover, this one result exceeding 2xAB was lower than the maximum concentration in the MCAS Cherry Point background data set for arsenic. These results indicate that the concentrations of arsenic in OU5 surficial aquifer groundwater are entirely consistent with background concentrations at the Air Station. See also the response to EPA general comment 2.

**Proposed action:** The text in the Risk Characterization section (7.5) will be revised to more effectively present the conclusion that detected arsenic concentrations at OU5 are representative of background conditions and not site-related activities. No



additional geochemical evaluation or discussion in the uncertainty section will be presented.

8. Several compounds possessed method detection limits (MDLs) above screening values or were found to be constituents that were retained as COPCs for other media. These constituents were categorized as Group 2 and Group 3 COPCs, and risks were quantified in the uncertainty section of the report. By including these compounds in the analysis, calculated risks did exceed the EPA's target risk management range. For example, the total current RME carcinogenic risk exceeds EPA's carcinogenic target risk range due to surface water ( $3 \times 10^{-3}$ ). The carcinogenic risk associated with exposure to surface water by an industrial worker is primarily associated with the PAHs analyzed for in surface water. The PAHs were retained as Group 2 COPCs. PAHs were not detected in surface water; however, their MDLs were greater than the applicable screening level. Due to the uncertainty associated with the concentrations of these constituents and the composition of the waste disposed of at the sites, further sampling with a more sensitive analysis should be considered and discussed.

**Response:**

*Disagree.* The PAHs in the surface water samples were analyzed by Method SW846 - 8270. The reporting limits (5-6 µg/L) are the same as those for the latest low-concentration CLP Superfund method, OLC03.2. This method was used because there was no history of PAH contamination at the site (i.e., PAHs were NOT detected above screening levels in any of the media at site 1, while for site 2, the only medium with PAHs above screening levels was the subsurface soil, with the maximum concentration being within about an order of magnitude of the screening level). If PAH contamination had been found during the scoping process, then a more sensitive method such as SW846-8270SIM (selective ion monitoring) with method detection limits (MDLs) as low as 0.5 µg/L (lower than the reporting limit by one order of magnitude) could have been used. This would have required analyzing for each individual analyte separately, resulting in the unnecessary use of a more expensive and time-consuming procedure.

It is unclear why assessment endpoints are being chosen in this stage of the Ecological Risk Assessment. While it is appropriate to select preliminary assessment endpoints, more specific assessment endpoints are not selected until Step 3b. The text should be clarified to state that the assessment endpoints presented in this section are preliminary in nature.

**Response:**

*Agree.* The text will be clarified to state that the assessment endpoints presented in this section are preliminary in nature.

Reconsidering the measurement versus background concentrations for inorganic materials at this Operable Unit may alter the thought of natural concentrations at the site. If this is the case, sections of the recommendations chapter will need to be reconsidered: This includes the statements of natural background in Section 9.5.1.1, paragraph 2; Section 9.5.1.2 paragraph 2; Section 9.5.4.1, paragraph 2; Section 9.5.4.2,

paragraph 2; Section 9.5.5.1, paragraph 2; Section 9.5.5.2, paragraph 2; Section 9.5.6, paragraph 2.

**Response:**

*Disagree.* See the response to EPA general comment 2.

Proposed action: The text in Section 9 (Conclusions and Recommendations) will be revised to more clearly indicate that the results for all detected inorganic constituents in soil and groundwater fell into one of two categories: (1) results were representative of naturally occurring background concentrations, or (2) results exceeding background concentrations were well below relevant risk-based screening criteria or regulatory standards.

9. The sampling scheme should be discussed in more detail. The fill areas have been identified as being approximately 200' to 400' in length and there has been only one sample collected at the edge of the fill area. This layout is more in line with a "Site Investigation" rather than a "Remedial Investigation". It is also stated that samples were collected from the area of crushed drums, however, the photos show drums that appear to be intact. Please elaborate on the conditions of the drum area and their contents.

**Response:**

*Disagree.* See the response to EPA general comment 1 above with regard to the sampling scheme. Since previous investigations conducted before the RI had not revealed the presence of significant contamination at OU5, it was necessary to utilize a sampling approach consistent with a site investigation to determine whether there was any contamination to delineate.

No intact drums containing any waste or virgin materials were found at OU5. The drums in the photos and all observed drums, while not crushed completely flat, were found to be empty and partially crushed.

Proposed action: None.

## Specific Comments

1. Page vi, Executive Summary, OU5 Physical Characteristics, paragraphs 4 and 5. This section discusses the Columbia Aquifer in detailed but confusing relationship to the Yorktown confining unit and surficial aquifer. The later section 4.3 and subsections discussing hydrology never mention the Columbia Aquifer in text or figures. It appears The Columbia aquifer is not in the region and this section needs revision.

**Response:**

*Agree.* The text in the Executive Summary is inconsistent with the information presented in Section 4.3. The Columbia aquifer is generally used in the State of Virginia as the name of the uppermost coastal plain aquifer, while the same hydrogeologic unit is commonly referred to in the State of North Carolina as the surficial aquifer.



**Proposed action:** The text in the Executive Summary will be revised to correct this inconsistency.

2. Page 2-4, Section 2.2.1, paragraph 1, and Table 2-2. Text states that screen intervals for the existing wells are listed as available in Table 2-2. No screen intervals are presented in the corresponding table. Please revise table to include screen intervals. It would also be useful to discuss screen depths with respect to fill areas and the suspected depths.

**Response:**

*Agree.* The screen depth intervals for each monitoring well in Table 2-2 will be added to the table. The depths or intervals of fill cannot be determined for these wells based on the historical borelogs. All soil descriptions are similar to native materials observed.

3. Figure 2-3, Debris and Fill Location Site 1. This figure depicts a yellow line, which represents the original Site 1 boundary. However, many of the fill areas are located outside of the yellow line. An additional line should be added to this figure (and others, as appropriate) identifying the new boundary under investigation at Site 1. This same comment applies to Figure 2-9, Debris and Landfill Map Site 2.

**Response:**

*Disagree.* The original site boundaries for Sites 1 and 2 were determined during the 1983 Initial Assessment Study (IAS) and are used in the MCAS Cherry Point EGIS to show site locations. As pointed out in the response to EPA general comment 3 above, our field activities determined that the actual location of some waste disposal areas extended outside of these boundaries, and this fact is pointed out in Section 2.1.2. In no way did the historical "site boundaries" influence the locations of investigation activities. The extent of the Site 1 and 2 study areas is readily apparent in Figures 3-1 and 3-2 of the RI report. As is the case in most field investigations, the study areas at OU5 extend beyond site boundaries to include adjacent surface water bodies and upgradient groundwater sampling locations.

**Proposed action:** None.

4. Figure 3-1. Based on a review of the figure, Sampling Locations at Site 1, there are no surficial soil sample locations located downgradient of the Site. These sample locations would have addressed the potential for surficial flow of contaminants to be redistributed off of the actual site. The same problem exists with Site 2.

**Response:**

*Disagree.* See the response to EPA general comment 1, specific element 4.

**Proposed action:** None.

5. Page 4-2, Section 4.2, paragraph 3. Site 1 undergoes controlled burning. Is this considered in risk analysis?

**Response:**

No. All forested areas at MCAS Cherry Point are subject to periodic controlled burns as part of the Air Station forest management program.

**Proposed action:** None.

6. **Page 4-4, Section 4.3.2.** The section does not reference figures, and thus is very confusing. Please refer to figures and show where OU5 sits with respect to these known layers. Thickness of layers and at what depth is not clearly defined, so reader has very little to mentally interpret the underlying groundwater zones.

**Response:**

*Agree with qualification.* A footnote will be added to Figure 4-5 referencing Figures 4-4 and 4-6. Figure 4-5 shows the geographic location of MCAS Cherry Point with corresponding hydrogeologic cross-section locations provided in Figure 4-6. A discussion of site-specific geology and hydrogeology is provided in Section 4.3.4, which references Figures 4-5 and 4-6 and discusses the subsurface geology relative to OU5. Only the details of the surficial aquifer and Yorktown confining unit are discussed with regard to OU5 because investigations of deeper subsurface geologic units have not been undertaken at OU5.

7. **Figure 4-2.** Please identify OU5 in the figure.

**Response:**

*Agree.* The location of OU5 will be added to Figure 4-2.

8. **Figure 4-5.** Please approximate and label location of OU5 in the figure.

**Response:**

*Agree.* The approximate location of OU5 will be added to Figure 4-5.

9. **Table 4-2.** Screen intervals should be included in the table. The data is available in appendices, but would be more useful in this table.

**Response:**

*Agree.* The screen depth intervals for the wells in Table 4-2 will be added to the table.

10. **Page 5-5, Section 5.2.1.3, paragraph 1.** Please revise conclusive statement regarding small magnitude of 2xAB inorganic exceedence per General Comment 2.

**Response:**

*Disagree.* See the response to EPA general comment 2.

**Proposed action:** None.

11. **Page 5-5, Section 5.2.1.5, paragraph 1.** Please revise conclusive statement regarding small magnitude of 2xAB inorganic exceedence per General Comment 2.

**Response:**



*Disagree.* See the response to EPA general comment 2.

**Proposed action:** None.

12. Page 5-6, Section 5.2.2.3, paragraph 1. Please revise conclusive statement regarding small magnitude of 2xAB inorganic exceedence per General Comment 2.

**Response:**

*Disagree.* See the response to EPA general comment 2.

**Proposed action:** None.

13. Page 5-6, Section 5.2.2.4, paragraph 2. Please revise conclusive statement regarding small magnitude of 2xAB inorganic exceedence per General Comment 2.

**Response:**

*Disagree.* See the response to EPA general comment 2.

**Proposed action:** None.

14. Page 5-9, Section 5.2.4.5. Please expand this section to include a discussion of how the hardness of water potentially affects the occurrence of the inorganic detections.

**Response:**

*Agree.* A discussion of the geochemical effects of the surface water hardness on the inorganic constituents detected in surface water samples will be added to Section 5.2.4.5.

15. Page 5-9, Section 5.2.5. S1-SD05 (which is located potentially upstream of Site 1 in Reeds Gut) had chemicals with maximum detected sediment concentrations that exceeded their respective ESVs and background include chromium, lead, and mercury. It is unclear if the chemicals detected at this site are site-related and this issue should be resolved.

**Response:**

*Disagree.* See the response to EPA general comment 2 above.

**Proposed action:** None.

16. Page 5-11, Section 5.3.1.3, paragraph 1. Please revise conclusive statement regarding small magnitude of 2xAB inorganic exceedence per General Comment 2.

**Response:**

*Disagree.* See the response to EPA general comment 2.

**Proposed action:** None.

17. Page 5-12, Section 5.3.1.3, top paragraph. Replace "2 of 8 samples" with "3 of 8 also produce a discussion of mercury where concentrations exceed 2xAB by 25%, 9% and 369%, which should be included. This may alter the conclusions regarding mercury conclusions.

**Response:**

*Disagree.* The cited sentence is correct at "2 of 8 samples". However, there are several data result errors in Table 5-9, one of which makes it appear that the result for sample OU5-S2-SS05 exceeded 2xAB when it actually does not. These errors will be corrected and any text statements reflecting the table data will be revised if necessary. With respect to the significance of the mercury results with respect to background concentrations, see the response to EPA general comment 2.

**Proposed action:** Correct errors in Table 5-9 and any associated text references.

18. Page 5-12, Section 5.3.1.5, paragraph 1. Please revise conclusive statement regarding small magnitude of 2xAB inorganic exceedence per last comment and General Comment 2.

**Response:**

*Disagree.* See the response to EPA general comment 2.

**Proposed action:** None.

19. Page 5-14, Section 5.3.3.3, paragraph 2. Text states that "... none of the results exceeded any regulatory screening criteria." Please change, since arsenic was detected above tap water criteria.

**Response:**

*Disagree.* See the response to EPA general comment 2.

**Proposed action:** The text in this section will be revised to more effectively state that all concentrations of inorganic constituents that exceeded any regulatory screening criteria, including arsenic, were consistent with MCAS Cherry Point background concentrations and are therefore not COPCs.

20. Page 5-16, Section 5.3.5. S2-SD05 had the maximum concentrations of cadmium, carbon disulfide, and Freon 11, in sediments. It is the furthest most downstream sample location and may potentially be influenced by contaminants from Site 2. It is unclear if the chemicals detected at this site are site-related and this issue should be resolved. Additionally, the contaminants are not delineated.

**Response:**

*Disagree.* None of the cited constituents were found in exceedance of any regulatory screening criteria in sample S2-SD05 or any other Site 2 sediment samples. Based on the results of soil and groundwater samples at Sites 1 and 2, these constituents do not appear be found in significant concentrations at either site.

**Proposed action:** None.

21. Table 5-9. Mercury reported in OU5-S2-SS05 at 0.6mg/kg should be in blue, well above 2xAB.

**Response:**



*Disagree.* There are several data result errors in Table 5-9, including the cited result for sample OU5-S2-SS05, which should be 0.16 J mg/kg rather than 0.6 mg/kg. The correct result does not exceed 2xAB and should not be in blue.

**Proposed action:** Correct errors in Table 5-9 and any associated text references.

22. **Page 6-9, Section 6.2.3.1, paragraph 4.** Please revise conclusive statement regarding small magnitude of 2xAB inorganic exceedence per general comment above.

**Response:**

*Disagree.* See the response to EPA general comment 2.

**Proposed action:** None.

23. **Page 6-12, Section 6.2.5.5, paragraph 1.** Final conclusions of upgradient groundwater using the 2 upgradient temporary wells show barium and lead and 1-1, DCE detections. Again use of these as "upgradient wells" is questioned. Regardless, also noted were higher concentrations of DCE, lead and barium in soil across these sites, which could contribute to the existing groundwater concentrations. Although there are low levels of detection upgradient, there is still a possible source contribution across these sites. Defining impacted areas here should be attempted across OU5.

**Response:**

*Disagree.* The 2 wells identified in this subsection as upgradient wells are clearly not located downgradient of any Site 1 or 2 disposal areas and appear to be reasonable choices for upgradient well locations. It is not clear why use of these as upgradient wells is questioned.

The findings of the RI with respect to soil and groundwater contamination are presented in Section 5 of the RI Report and are evaluated in both human health and ecological risk assessments in Sections 7 and 8, respectively.

**Proposed action:** None.

24. **Page 7-4, Section 7.2.1.1, paragraph 2.** Depths of the surface and subsurface soil samples collected at both sites were not included in this section. Please include these sample depths for the purpose of clarity.

**Response:**

*Agree.* The depths for the soil samples collected at OU5 will be added to Section 7.2.1.1.

25. **Page 7-4, Section 7.2.1.2, paragraph 4.** The text states that an additional sediment sample (S1-SD01) was collected at Site 1. Please provide justification regarding the reason a coexisting surface water sample was not collected at this location.

**Response:**

*Agree.* A statement will be added to Section 7.2.1.2 describing the physical conditions at location S1-SD01, specifically the lack of surface water at this location, which is the reason why no surface water sample was collected.

26. **Page 7-5, Section 7.2.1.3, paragraph 1.** This section discusses the status of monitoring well 1GW01. This monitoring well location cannot be located on the respective figure. However, there is a monitoring well location 1MW01. Please correct the discrepancy if this is the well being discussed in this section.

**Response:**

*Agree.* The designations for monitoring wells will be corrected on all figures by replacing the "MW" designation with "GW".

27. **Page 7-9, Section 7.3.1.1, paragraph 3.** The text indicates that the most important aquifer in the vicinity of the MCAS Cherry Point is the Castle Hayne Aquifer. Please include the proximity of this aquifer in relation to the site.

**Response:**

*Agree.* A discussion of the subsurface location of the Castle Hayne Aquifer relative to the site will be added to Section 7.3.1.1.

28. **Page 7-20, Section 7.5.1.2, paragraph 5.** The text states that a  $2 \times 10^{-6}$  excess lifetime carcinogenic risk means that for every one million people exposed to the carcinogen throughout their lifetimes, the incidence of cancer may increase by two cases. The description of  $1 \times 10^{-x}$  risk estimates is not accurate, and it may provide confusing information to potentially exposed sub-populations. The calculated cancer risk represents the probability of excess individual cancer risk. Rather than indicate that 1 person in a population of  $10^x$  people will get cancer, risk values estimate the probability of an excess cancer for an individual with the exposure parameters selected (i.e. each roving worker would have an individual excess cancer risk of  $1 \times 10^{-x}$ ). Please change the definition accordingly.

**Response:**

*Agree.* The suggested changes will be incorporated in the HHRA text.

29. **Page 7-23, Section 7.5.2.4, paragraph 5.** The text in this section states that exposure to sediment in Reed's Gut was evaluated for industrial site workers, adolescent trespassers/visitors, and future adult and child residents who could be exposed to surface water through incidental ingestion and dermal contact while wading. This section discusses those receptors that could be exposed to sediment. Please address this discrepancy.

**Response:**

*Agree.* Text will be corrected to reflect exposure to sediment only.

30. **Page 7-37, Section 7.7, paragraph 1.** The text states that due the fact that arsenic is a ubiquitous element, and the calculated hazard is most likely associated with background condition, it is not necessary to calculate RGOs for either site. See General Comment 7 above regarding arsenic.

**Response:**



*Disagree.* See the response to EPA general comment 2.

**Proposed action:** None.

31. Page 8-4, Section 8.2.2., Para 4. This section discusses the results of the sampling for the two sites. It is important to note that no results were reported for PCBs, dioxins, and/or pesticides/herbicides. Since these two landfills are comprised of a variety of fill and dump material, it is highly likely that these constituents may be present in any or all of site related media. Until this major data gap is resolved, the potential ecological risk that may be present at either Site cannot clearly be determined.

**Response:**

*Disagree.* See the response to EPA general comment 1, specific element 2.

**Proposed action:** None.

32. Page 8-5, Section 8.3, Para 1. The text states that food chain modeling was not conducted in Step 3A due to the lack of bioaccumulative chemicals being detected in sediment and soil at concentrations in excess of background over a wide area. This statement is putting the cart before the horse. One must first do the steps stated earlier for 3A (i.e., background comparison) before any decision not to perform modeling can be supported. In addition, the need to perform modeling for bioaccumulative chemicals is not based on having exceedances over a wide area. Step 3A still retains some level of conservatism and an area use factor of 1 should be applied during modeling. In Step 3A, until the two Sites have been separated, the use of mean values is meaningless.

**Response:**

*Agree with Qualification.* The Navy agrees with the commentor's first point. The text will be clarified to address the fact that food chain modeling was not conducted because, based on refined exposure assumptions, there were no bioaccumulative chemicals that both exceeded benchmarks and were present in excess of background levels. The Navy disagrees with the comment that the two sites need to be separated for the average concentration to have meaning. It is likely that the term "sites" has lead the reviewer to conclude that the areas are distant spatially and different with respect to the nature of contamination. This is not the case. As shown in Figure 2-2, the two "sites" are "separated" by a 2-lane road (some paved, some gravel) that is not heavily used. The boundaries of the sites, which were arbitrarily drawn, are 100 feet apart at their closest point. On either side of this road there are pockets of fill materials spread out over a total of approximately 8 acres. Some of these pockets are separated by more than 100 feet. The nature of inorganic contamination at Sites 1 and 2 was similar. One difference between the two sites is that Site 1 contained low levels of some PAHs. This is not unexpected, as the wooded area adjacent to Site 1 had been recently burned. The organisms living on either side of the road do not represent two independent communities. Even the aquatic habitats are all hydrologically connected (the pond would be hydrologically connected to Mill Creek during heavy rainfall events). Average concentrations in the report represent the exposure to which local populations of terrestrial and aquatic receptors are exposed relative to this entire disposal area.

33. **Page 8-6, Section 8.3.3. Frequency of Detection.** In this section, the summary of chemicals detected at the site was reviewed based on frequency of detection. It is believed that the data from the two sites should not have been combined, thus, making the use of frequency of detection inconclusive until two sites are reviewed individually.

**Response:**

*Disagree.* Please see response to EPA specific comment 32.

34. **Tables 8-1 through 8-3.** These tables present a summary of the results for surface soil, sediment, and surface water. In all of these tables, no results were reported for PCBs, dioxins, and/or pesticides/herbicides. Since these two landfills are comprised of a variety of fill and dump material, it is highly likely that these constituents may be present in any or all of site related media. No text could be found in the document documenting why these constituents were not part of the analytical program.

**Response:**

*Disagree.* Please see response to EPA general comment 1.

35. **Based on Table 8-4 Soil Screening table.** It is unclear why some chemicals were carried forward to Step 3a when they were non-detected, had ESVs, and no other chemical in the same group were carried forward. For example, benzo(a)pyrene was not detected (reporting range 360 to 460) had an ESV of 100  $\mu\text{g/kg}$ , yet the HQ was stated as being 4.80. Please review the table and revise as necessary.

**Response:**

*Agree.* From this comment, it appears that it is Region 4 policy to not carry through contaminants that are not detected and have ESVs, independent of whether the detection limit is above the ESV. The table and text will be revised accordingly.

36. **On Table 8-6, Step 2 Screening - Surface Water.** Cadmium and mercury were not detected in any of the samples. However, they have calculated HQs of 37.9 and 16.7, respectively. Even using 1/2 of the SQL, the ESVs for each chemical would not be exceeded. It is unclear where the concentrations used to calculate the HQs were obtained and this issue should be clarified. Of additional concern is the fact that toluene was detected in surface water according to Table 8-6. However, a review of Table 2.3 (Human Health Risk Assessment) found that toluene was not detected in surface water. The discrepancy between the two tables should be resolved and all tables reviewed to ensure consistency for all constituents.

**Response:**

*Disagree.* The HQs were calculated by dividing the maximum detection limit (maximum of the reporting limit range) for those non-detected inorganics by the ESVs (for mercury,  $0.20/0.012 = 16.7$ ). Using this method, the HQs for mercury and cadmium would still be over 1 if one-half the maximum of the reporting limit range were used. With regard to toluene, the tables are not incorrect. Toluene was detected in one sample at Site 2. Table 2.3 (human health risk assessment) pertains to Site 1 at which toluene was not detected.



**Proposed action:** As indicated in the response to EPA specific comment 35, HQs will not be calculated for contaminants that are not detected, if that is Region 4 policy.

37. **Table 8-8 Step 3 Screening Surface Soil.** For chemicals with non-detects, the arithmetic mean is presented. Normally, 1/2 of the sample quantitation limit (SQL) is used. It is unclear where these values were obtained.

**Response:**

*Agree.* Averages were calculated as suggested by the commentor. Non-detects were halved (i.e., 5 would have been used for a 10 U), prior to averaging.

38. **Page 9-1, Section 9.1, surface soil bullet 2.** Please revise conclusive statement regarding small magnitude of 2xAB inorganic exceedence per General Comment 2.

**Response:**

*Disagree.* See the response to EPA general comment 2.

**Proposed action:** None.

39. **Page 9-1, Section 9.1, surface soil bullet 3.** Please revise statement regarding small magnitude of 2xAB inorganic exceedence per General Comment 2.

**Response:**

*Disagree.* See the response to EPA general comment 2.

**Proposed action:** None.

40. **Page 9-1, Section 9.1, subsurface soil bullet 3.** Please revise statement regarding small magnitude of 2xAB inorganic exceedence per General Comment 2.

**Response:**

*Disagree.* See the response to EPA general comment 2.

**Proposed action:** None.

41. **Page 9-2, Section 9.2, bullet 2.** Text states that metal migration is not likely significant to sediment/water from soils. Section 6.2.3.1 paragraph 4, last sentence says that Sites 1 and 2 are potential sources of metals to surface water. Low pH in some samples, appendix H, supports this, as low pH often leads to high inorganic compound mobility.

**Response:**

*Disagree.* Section 6.2.3.1 indicates that Sites 1 and 2 soils are *potential* sources of metals to surface water. Since metals are natural components of soils, even the soils at pristine sites are potential sources of metals to surface water. However, Section 9 concludes that at OU5, since the concentrations of metals in soils were found to be consistent with MCAS Cherry Point background concentrations in virtually all samples, and in the cases of the few exceptions, the concentrations were below any regulatory screening criteria, that the migration of metals from soils to surface water is not likely to be significant.

**Proposed action:** None.

42. Page 9-3, Section 9.4, Screening Level Ecological Risk Assessment. It is stated that no soil compounds were found to have a HQ greater than 1. This statement is not correct. The correct statement would be that several chemicals were detected at both Sites with HQs greater than 1. However, many of the chemicals were screened out when comparing maximum concentrations to twice the mean background concentration or due to low frequency of detection. Based on a review of the data and at a minimum, for Site 1, selenium and silver remain as COPECs. For Site 2, barium and cadmium remain as COPECs. It is impossible to fully determine which chemicals should remain as COPECs due to the manner in which the SLERA was conducted.

**Response:**

*Agree with Qualification.* The statement is not correct as the commentor points out. This statement will be revised. However, the Navy disagrees that the analysis should have been split between Site 1 and Site 2, as discussed in response to EPA specific comment 32. In addition, the Navy does not believe any additional investigation or risk assessment are warranted.

43. Page 9-4, Section 9.5.1.1, paragraph 2. Please revise conclusive statement regarding small magnitude of 2xAB inorganic exceedance per General Comment 2.

**Response:**

*Disagree.* See the response to EPA general comment 2.

**Proposed action:** None.

44. Page 9-4, Section 9.5.1.2, paragraph 2. Please revise conclusive statement regarding small magnitude of 2xAB inorganic exceedance per General Comment 2.

**Response:**

*Disagree.* See the response to EPA general comment 2.

**Proposed action:** None.

45. Page 9-7, Section 9.5.6. Please comment on the 1,1-DCE detections. This section does not actually give recommendations other than a general statement for a feasibility study in the last few sentences. Please show what is to be conducted in the feasibility study and discuss in more detail what is shown in attached tables.

**Response:**

*Disagree.* 1,1-DCE was detected at trace concentrations in a number of groundwater samples at OU5. It was not identified as a risk driver in either the human health or ecological risk assessments. Nor was the NC 2L standard for 1,1-DCE exceeded in any sample. The proposed Focused Feasibility Study is intended to address constituents found in exceedance of NC 2L Standards (chloroform and benzene), as stated in this subsection.

**Proposed action:** None.



46. **Section 9.5.6., Page 9-8, Para 0.** It is recommended that No Further Action is requested for site related media. The finding of No Further Action is not supported due to the exceedances of ESVs, the present of debris at the site, and the failure to sample dioxins, PCBs, pesticides and herbicides.

**Response:**

*Disagree.* The recommendation for No Further Action applies only to surface water and sediment at Sites 1 and 2 and soil at Site 2, as stated in this subsection. The remaining media are proposed for inclusion in a Focused Feasibility Study.

As stated earlier, the RI sampling was conducted in accordance with the EPA-approved and State-approved Work Plan. See the response to EPA general comment 1, specific element 2 with respect to the issue of sample analytes.

**Proposed action:** None.

47. **Table 9-1.** Arsenic detections statistics for Site 1 has a maximum of detection of 4.9 mg/kg, not 2.6 mg/kg. The mercury maximum detection is 0.058 mg/kg. Please revise.

**Response:**

*Agree with qualification.* The arsenic maximum concentration in Table 9-1 for Site 1 should be 4.9 mg/kg. The maximum mercury concentration of 0.5 mg/kg is correctly stated for Site 1. The 0.058 mg/kg concentration stated in the comment is the BTAG soil fauna and flora criteria, not a detected concentration in any sample. However, as discussed in the response to EPA specific comment 17, there is an error in Table 5-9 with respect to a reported concentration of mercury of 0.6 mg/kg at Site 2. The actual maximum concentration of mercury in Site 2 surface soil is 0.16 mg/kg, which will be corrected in Table 9-1.

48. **Table 9-2.** Chloroform was detected in 5 of 8 samples not 1 of 8 in Site 1. Please revise.

**Response:**

*Disagree.* Chloroform was detected in only 1 of 8 subsurface soil samples at Site 1 as indicated in Table 9-2.

49. **Table 9-3.** For Site 2, arsenic was detected in 2 permanent wells. Please include arsenic in the table.

**Response:**

*Agree.* Arsenic will be added to the Site 2 section of Table 9-3.

50. **Appendix C.** shows a detection of toluene in sediment at a concentration of 96mg/kg at S1-SD01, and 0.6mg/kg in S1-SW01. This is not presented in text or tables before the risk assessment. The same is true for Freon-11, detected in several soil samples across Sites 1 and 2. Again, the document expresses lack in organization and stepwise story telling about this site. Present all detections and exceedences in Chapter 5.

**Response:**

*Disagree.* Appendix C does not indicate detected concentrations of toluene at the Site 1 sample locations listed in the comment. However, toluene was detected in Site 2 surface water at location S2-SW02 and in sediment at S2-SD01. Discussions of these detections are provided in the Nature and Extent of Contamination Section 5.3.4.1 for surface water and Section 5.3.5.1 for sediment. Tables 5-13 and 5-14, also in the Nature and Extent of Contamination Section preceding the risk assessment sections, list toluene as a detected compound. Freon-11 (Trichlorofluoromethane [TCFM]) results are also discussed in Section 5, and detections are shown on the Section 5 tables.

**Proposed action:** With regard to TCFM, footnotes and text changes will be made to reconcile the naming convention for this compound.

51. **Appendix E.** Well Completion diagram S1-TW08, appears to have an unknown depth and unknown depth to screen. Please provide these values.

**Response:**

*Agree.* The well construction data will be added, including total depth of the monitoring well and screen placement.

52. **Appendix G.** Tables G-1 and G-2 indicate that upgradient sampling locations for groundwater and surface water have lowest pHs. Flow toward the Reed's Gut and downstream in Reed's gut becomes progressively less acidic. This should be discussed with respect to contaminant migration.

**Response:**

*Agree.* A discussion of the effect of pH on fate and transport of contaminants at OU5 will be added to Section 6.2.

### **Comments Received from Sandy Mort, North Carolina Department of Environment and Natural Resources (NCDENR)—May 4, 2005**

A review of the technical components of the OU5 RI has been completed by ATU, focusing on eco-toxicity issues. Conclusions drawn and recommendations made based on the data appear appropriate. Following are ATU's comments on the OU5 RI.

1. Section 8.1.5—Explain the reasoning behind not carrying forward to Step 3 of the EcoRA COPCs that exceeded NCWQS unless they also exceeded Region IV screening values. It would seem that a NC standard should take precedence over a screening value.

**Response:**

Earlier comments from Mr. Dave Lilley of NCDENR (dated March 2004) indicated that "In addition to the Region 4 screening values, sampling results must be compared to the NC Surface Water Standards. Contaminants that exceed the NC Surface Water Standards should not be carried to Step 3 unless they also exceed the Region 4 screening value. Exceedances of the NC Surface Water Standards should be compiled in a separate table." As such, contaminants with exceedances over the NC Surface Water Quality Standards only were not carried through to Step 3 of the ecological risk assessment.



**Comments Received from North Carolina Department of Environment and Natural Resources (NCDENR)—April 26, 2005**

1. Page 7-38: Please provide the equation used to calculate the RGOs along with an example.

**Response:**

The suggested changes will be incorporated into text portion of the HHRA.

2. Table 7-26: It is unclear to the reader why a RGO for arsenic was calculated for the future child resident exposure to subsurface soil. Table 9.4 in Appendix I2 does not list arsenic as a COPC. Please correct this inconsistency.

**Response:**

The RGO presented in Table 7-26 is for arsenic in surface water, not subsurface soil. Corrections will be made to the table.

**Comments Received from U.S. Environmental Protection Agency—July 19, 2005**

1. [Regarding Executive Summary, Site 2 Depth of Waste] The first sentence reads: "debris was observed in the subsurface". The text also continues to say, "...construction debris was present in the soil cores." The text further states, "no obvious debris was encountered in the subsurface samples. These statements contradict each other.

**Response:**

Statement that "no obvious debris was encountered in the subsurface samples" is in error. The previous description of the subsurface is correct. The text has been changed.

2. Same comment as Comment 1 referring to Section 4.3.4.4.

**Response:**

See response to Comment 1.

